

REMARKS

Enclosed herewith is a Substitute Specification in which the specification as filed has been amended in various places to correct typographical and grammatical errors, and to also add section headings. In addition the specification as filed has been amended to particularly address the informalities noted by the Examiner on Page 5 of the current Office Action.

In support of the above, enclosed herewith is a copy of the specification as filed marked up with the above changes.

The undersigned attorney asserts that no new matter has been incorporated into the Substitute Specification.

The Examiner has objected to the drawings in that Fig. 7 does not include a reference to "F₁" relating to a future frame of the image signal (although mentioned in the specification as filed on page 10, line 27).

Applicants submit that this mentioning of "F₁" relates to the embodiment of Figs. 5 and 6 (note the opening two sentences of the paragraph beginning on page 10, line 26). Fig. 7 shows an alternative embodiment as described in the remainder of the paragraph at line 28 to page 11, line 6. As such, Applicants believe that Fig. 7 is accurate as it stands.

The claims have been amended to more clearly define the invention as disclosed in the written description. In particular, the claims have been amended for clarity.

Applicants believe that the above changes answer the Examiner's objections to the claims and respectfully request withdrawal thereof.

The Examiner has finally rejected claims 1-13, 15 and 16 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 6,310,982 to Allred et al. The Examiner has further finally rejected claim 14 under 35 U.S.C. 103(a) as being unpatentable over Allred et al. in view of U.S. patent 5,055,927 to Kessen et al.

The Allred et al. patent discloses a method and apparatus for reducing motion artifacts and noise in video image processing, in which the differences between currently received pixels ($X_i(t)$) and filtered pixels from a previous frame ($X_o(t-1)$) are processed in a spatial filter 18, weighted average or signal ratios 38 and filter functions 26, the resulting signals being added to the filtered pixels from the previous frame to form the output filtered pixels ($X_o(t)$).

The subject invention, as claimed in claims 1 and 14-16, includes the limitations "determining a spatial spread of a set of original pixel values (P_t , M_i) in at least one image of the image sequence (V1)" and "determining statistics from said spatial spread in said at least one image of the image sequence (V1)".

In the current Office Action, the Examiner states:

"Note that the claimed spatial spread appears to be defined in page 9 of the remarks and states: In particular, the

specification, on page 2, lines 9-12 states "The spread is a measure based on differences between pixel values...[regardless of a temporal and/or spatial relationship.]""

The Examiner then states "In light of the above statement, Allred et al. does disclose a spatial spread that is based on differences in the same image or as claimed:...."

Applicants again submit that the Examiner is taking Applicants statements out of context. In particular, Applicants statement "The spread is a measure based on differences between pixel values...." is technically correct. However, the claims do not claim "determining a spread" but rather "determining a spatial spread...", which is the differences between pixels in the same image. Now, while Allred et al. does determine differences between "values" in the same image, these "values" are temporal differences between pixels of an image and corresponding pixels of a delayed filtered image. Hence, what is shown in Figs. 5a and 5b is an array of temporal difference values. The spatial spread in this case would be a measure based on differences between these temporal difference values.

Applicants stress that claims 1 and 14-16 specifically state "determining a spatial spread of a set of original pixel values (P_t , M_i) in at least one image of the image sequence (V_1)", and that this is neither shown nor suggested by Allred et al.

Applicants note that the above limitation indicates that the spatial spread is determined "in at least one image of the image sequence". However, it should be noted that in the embodiment of the invention as shown in Figs. 5 and 6, the current image F0 as well as the preceding image F-1 and the successive image F1 are being considered. While this embodiment only discloses the spatial spread being determined in the current image F0, it is conceivable that the spatial spread may also be determined in the preceding image F-1 as well as in the successive image F1, along with the temporal spread, in order to arrive at the filtered pixels.

The Kessen et al. patent discloses a dual channel video signal transmission system in which an HDTV signal is encoded onto two channels, transmitted, and then the received 2-channel signals are recombined in a combiner and filter 9 to reform the HDTV signal.

The Examiner now states "Kessen et al. does teach a process as suggested by Allred et al. of a) encoding (Fig. 1, num. 2 and 6 receive images) a plurality of filtered images (Fig. 1 "HDTV" on the left and right ends are the same) Note that HDTV of fig. 1 is produced from a filter 9 of fig. 1."

This statement by the Examiner does not make any sense. Clearly, the elements to the left of the vertical dashed line are at a transmitter which receives an HDTV signal for transmission, while the elements to the right of the vertical dashed line are at

a receiver which receives the two channels transmitted by the transmitter, and combines the received signals in the combiner and filter 9 to reformulate the HDTV signal. This is supported by Kessen et al. at col. 2, lines 24-30, which states:

"In FIG. 1 a high definition television signal HDTV from a source such as a television camera is fed to a first transmission path comprising a transcoder 1, a TV signal encoder 2, a TV signal decoder 3 and a transcoder 4. A second transmission path comprises an image suppression circuit 5, an HD encoder 6, an HD decoder 7 and an image regeneration circuit 8."

Kessen et al. further adds, at col. 2, lines 46-49:

"In the receiver portion of the first transmission channel the incoming standard TV signal is decoded in a TV decoder 3. A standard TV signal is produced at the output of decoder 3."

Finally, Kessen et al., at col. 2, line 66 to col. 3, line 16, states:

"In the receiver for the second transmission channel, the incoming signal is applied to an HD decoder 7. The output of HD decoder 7 is connected to a picture regenerating circuit 8, which reconstructs images removed at the transmitter via a motion estimation technique involving comparison of blocks of image pixels. At the output of circuit 8 an HD signal with high spatial resolution and with a scanning rate of e.g. 50 Hz is provided, but with possible errors in the case of image motion.

"In order to reduce these errors in areas of image motion to thereby increase temporal resolution of the incoming HDTV signal, from the standard TV signal a transcoder 4 performs an inversion of the scanning rate conversion previously performed by transcoder 1. Output signals from transcoder 4 and from picture regeneration circuit 8 are applied to a signal combining and filtering network 9, which by means of appropriate

signal weighting delivers an HDTV output signal with high temporal and spatial resolution."

Applicants submit that it should be clear to one skilled in the art that the HDTV signal at the left of Fig. 1 is not a feedback of the HDTV signal at the right of Fig. 1. Rather, as specifically disclosed in Kessen et al., the HDTV (left) signal originates from a high definition television signal source (not shown), while the HDTV (right) signal is a high definition television signal reconstructed from the two signals transmitted on the first and second channels.


As such, Applicants submit that Kessen et al. neither discloses nor suggests "encoding a plurality of filtered image" as specifically claimed in claim 14.

Applicants submit that Kessen et al. does not supply that which is missing from Allred et al., i.e., "determining a spatial spread of a set of original pixel values (P_t , M_i) in each image of the image sequence (V1)" and "determining statistics from said spatial spread in each image of the image sequence (V1)".

In view of the above, Applicants believe that the subject invention, as claimed, is neither anticipated nor rendered obvious by the prior art, and as such, is patentable thereover.

Applicants believe that this application, containing claims 1-16, is now in condition for allowance and such action is respectfully requested.

Respectfully submitted,

by 
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